

AMENDMENTS TO THE CLAIMS

Please amend the claims as indicated hereafter.

Claims:

1. (Currently amended) A method for separating [[the]] a polyolefin component from [[the]] a polyamide component of a post-consumer or post-industrial commingled waste containing both polyolefin and polyamide polymeric components comprising:
 - (a) admixing the commingled waste with an ester solvent composition, wherein the polyolefin is immiscible in the ester solvent composition;
 - (b) heating the admixture to a temperature above the melting temperature of the polyolefin component sufficient to dissolve at least a portion of the polyamide component of the commingled waste in the ester solvent composition and form a separate immiscible molten polyolefin phase;
 - (c) separating the ester solvent composition containing dissolved polyamide from the immiscible polyolefin phase.
2. (Original) The method of claim 1 wherein in step (a) the ester solvent composition comprises about 98% to about 30% by weight of the admixture.
3. (Original) The method of claim 1 wherein in step (a) the commingled waste is composed predominantly of Nylon 6 fibers commingled with polypropylene fibers.

4. (Original) The method of claim 1 wherein in step (a) the commingled waste is composed predominantly of Nylon 6,6 fibers commingled with polypropylene fibers.

5. (Original) The method of claim 1 wherein in step (b) the admixture is heated to a temperature above about 220 degrees Celsius to dissolve Nylon 6,6.

6. (Original) The method of claim 1, wherein in step (a) the ester solvent composition is predominantly ethylene carbonate, propylene carbonate, butylene carbonate, or combinations thereof.

7. (Original) The method of claim 1 wherein in step (a) the ester solvent composition is predominantly propylene carbonate.

8. (Original) The method of claim 1 wherein in step (a) the ester solvent composition contains a cyclic ester and decomposition products of poly(ethylene terephthalate) formed by heating poly(ethylene terephthalate) in the presence of a cyclic ester to a temperature above about 215 degrees Celsius.

9. (Original) The method of claim 8 wherein the ester solvent composition contains propylene carbonate and decomposition products of poly(ethylene terephthalate) formed by heating poly(ethylene terephthalate) in the presence of propylene carbonate to a temperature above about 215 degrees Celsius.

10. (Original) The method of claim 1 wherein in step (b) the ester solvent composition contains dissolved polyamide polymer and suspended undissolved polyamide polymer separate from the immiscible molten polyolefin phase.

11. (Currently amended) A method for separating the Nylon 6 polymer component from the polyolefin polymer component of commingled post-consumer carpet waste containing at least polyolefin and Nylon 6 polyamide fibers comprising:

(a) admixing the commingled carpet waste with an ester solvent composition containing at least one cyclic ester; (b) heating the admixture to a temperature above about 190 degrees Celsius for a period of at least about 5 minutes to dissolve at least a portion of the Nylon 6 fibers in the ester solvent composition and form a separate discrete molten polyolefin phase; and (c) separating the discrete molten polyolefin phase from the ester solvent composition phase by skimming, filtration, centrifugation, or combinations thereof; ~~(d) cooling the ester solvent composition to a temperature below about 150 degrees Celsius to precipitate dissolved Nylon 6 polymer; and (e) separating the cooled ester solvent composition from Nylon 6 polymer by electrophoresis, sedimentation, flocculation, filtration, centrifugation, or combinations thereof.~~

12. (Original) The method of claim 11 wherein in step (a) the ester solvent composition containing at least one cyclic ester is predominantly propylene carbonate, ethylene carbonate, butylene carbonate or mixtures thereof.

13. (Original) The method of claim 11 wherein in step (b) the admixture is heated to a temperature above about 200 degrees Celsius.

14. (Original) The method of claim 11 wherein in step (a) the commingled carpet waste constitutes between 2% and 50% by weight of the admixture.

15. (Original) The method of claim 11 wherein the post-consumer carpet waste containing polyolefin and Nylon 6 polyamide fibers contains polypropylene fibers derived from the carpet backing structure.

16. (Original) The method of claim 15 wherein the post-consumer carpet waste containing polyolefin and Nylon 6 fibers denotes the fibrous components of a pre-processed waste which process comprises physically sorting post-consumer waste to obtain a sorted carpet waste composed exclusively of carpet pieces containing only Nylon 6 face fibers, then separating the fibrous components of the sorted carpet waste from dirt and non-fibrous carpet backing components by shredding, cutting, grinding, washing, screening, air elutriation, particle size separation techniques, and combinations thereof.

17. (Currently amended) A method for separating [[the]] a Nylon 6,6 polyamide polymer component from [[the]] a polyolefin polymer component of commingled post-consumer carpet waste containing at least polyolefin and Nylon 6,6 fibers comprising: (a) admixing the commingled carpet waste with an ester solvent composition containing at least one cyclic ester; (b) heating the admixture to a temperature above about 215 degrees Celsius for a period of at least about 5 minutes to dissolve at least a portion of the Nylon 6,6 fibers in the ester solvent composition and form a separate discrete molten polyolefin phase; and (c) separating the discrete molten polyolefin phase from the ester solvent composition phase by skimming, filtration, centrifugation, or combinations thereof; ~~(d) cooling the ester solvent composition to a temperature below about 170 degrees Celsius to precipitate dissolved Nylon 6,6 polymer; and (e) separating the cooled ester solvent~~

~~composition from Nylon 6,6 polymer by electrophoresis, sedimentation, flocculation, filtration, centrifugation, or combinations thereof.~~

18. (Original) The method of claim 17 wherein in step (a) the ester solvent composition is predominantly propylene carbonate, ethylene carbonate, butylene carbonate or mixtures thereof.

19. (Original) The method of claim 17 wherein in step (b) the admixture is held at a temperature above about 215 degrees Celsius for a period of at least about 15 minutes.

20. (Canceled).

21. (Original) The method of claim 17 wherein the post-consumer carpet waste containing polyolefin and Nylon 6,6 polyamide fibers contains polypropylene fibers derived from the carpet backing structure.

22. (Original) The method of claim 21 wherein the post-consumer carpet waste containing polyolefin and Nylon 6,6 fibers denotes the fibrous component of a pre-processed waste which process comprises physically sorting post-consumer waste to obtain a sorted carpet waste composed exclusively of carpet pieces containing only Nylon 6,6 face fibers, separating the fibrous component of the sorted carpet waste from at least some dirt and non-fibrous carpet backing components by shredding, cutting, grinding, washing, screening, air elutriation, particle size separation techniques, and combinations thereof.

23. (Original) The method of claim 17 wherein in step (a) the ester solvent composition is propylene carbonate.

24. (Original) The method of claim 1 wherein in step (c) the ester solvent composition containing dissolved polyamide and the immiscible polyolefin phase are cooled prior to separation to form an ester composition containing suspended polyamide and a separate solid polyolefin mass.

25. (New) A method for separating a polyolefin component from a polyamide component of a commingled polymer composition comprising:

(a) admixing the commingled polymer composition with an ester solvent composition comprising at least one cyclic ester, wherein the polyolefin is immiscible in the ester solvent composition;

(b) heating the admixture to a temperature above the melting temperature of the polyolefin component sufficient to dissolve at least a portion of the polyamide component of the commingled polymer composition in the ester solvent composition and to form a separate immiscible molten polyolefin phase; and

(c) separating the ester solvent composition containing dissolved polyamide from the immiscible polyolefin phase.

26. (New) The method of claim 25, wherein the ester solvent composition comprises about 98% to about 30% by weight of the admixture.

27. (New) The method of claim 25, wherein the commingled polymer composition comprises at least one of Nylon 6, Nylon 6,6, propylene and mixtures thereof.

28. (New) The method of claim 25, wherein the admixture is heated to a temperature above about 220 degrees Celsius.

29. (New) The method of claim 25, wherein the ester solvent composition comprises ethylene carbonate, propylene carbonate, butylene carbonate, or combinations thereof.

30. (New) The method of claim 25, wherein the cyclic ester solvent composition is predominantly propylene carbonate.

31. (New) The method of claim 25, wherein the ester solvent composition comprises decomposition products of poly(ethylene terephthalate).

32. (New) The method of claim 25, wherein the ester solvent composition contains dissolved polyamide polymer and suspended undissolved polyamide polymer separate from the immiscible molten polyolefin mass.

33. (New) A method for separating a Nylon 6 polymer component from a polyolefin polymer component of a commingled polymer composition comprising:

(a) admixing the commingled polymer composition with a carbonate ester solvent composition;

(b) heating the admixture to a temperature above about 190 degrees Celsius to dissolve at least a portion of the Nylon 6 polymer component in the carbonate ester solvent composition and form a separate discrete molten polyolefin phase; and

(c) separating the discrete molten polyolefin phase from the carbonate ester solvent composition phase.

34. (New) The method of claim 33, wherein the admixture is heated to a temperature above about 200 degrees Celsius.

35. (New) The method of claim 33, wherein the commingled polymer composition comprises between 2% and 50% by weight of the admixture.

36. (New) The method of claim 33, wherein the commingled polymer composition comprises polypropylene.

37. (New) The method of claim 33, wherein the carbonate ester solvent comprises propylene carbonate, ethylene carbonate, butylene carbonate or combinations thereof.

38. (New) The method of claim 34, wherein the commingled polymer composition comprises carpet.

39. (New) A method for separating a Nylon 6,6 polyamide component from a polyolefin polymer component of commingled polymer composition comprising:

(a) admixing the commingled polymer composition with a carbonate ester solvent composition to form an admixture;

(b) heating the admixture to a temperature above about 215 degrees Celsius to dissolve at least a portion of the Nylon 6,6 fibers in the carbonate ester solvent composition and to form a separate discrete molten polyolefin phase; and

(c) separating the discrete molten polyolefin phase from the carbonate ester solvent composition.

40. (New) A polyolefin composition obtained by

- (a) admixing a commingled polymer composition comprising polyolefin and polyamide with a carbonate ester solvent composition to form an admixture;
- (b) heating the admixture to a temperature above the melting temperature of the polyolefin sufficient to dissolve at least a portion of the polyamide and to form a separate immiscible molten polyolefin phase; and
- (c) separating the polyolefin from the dissolved polyamide and carbonate ester solvent composition.

41. (New) A polyamide composition obtained by

- (a) admixing a commingled polymer composition comprising polyolefin and polyamide with propylene carbonate to form an admixture;
- (b) heating the admixture to a temperature above the melting temperature of the polyolefin sufficient to dissolve at least a portion of the polyamide and to form a separate immiscible molten polyolefin phase; and
- (c) separating the immiscible polyolefin phase from the admixture.